

## The SEOM Sentinel-3 Hydrologic Altimetry Processor prototypE (SHAPE) Project

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The SHAPE study was kicked off in September 2015. SHAPE stands for Sentinel-3 Hydrologic Altimetry Processor prototypE. The team, the objectives, the work breakdown structure, the methodology, the technical approaches, the first results as well as the status and the upcoming milestones of the project will be presented. This study is part of SEOM, Scientific Exploitation of Operational Missions, an ESA programme element which aims at expanding the international research community, strengthening the leadership of the European EO research community and addressing new scientific researches.

This Research and Development study not only intends to make the best use of all recent improvements in altimetry but also clearly pushes for major breakthroughs that should boost the scientific use of the SAR altimetry data in hydrology. The stakes are high in the context of climate change, as scientists need to improve their analyses of water stocks and exchanges over wide geographical regions.

The study focuses on three main variables of interest in hydrology: river stage, river discharge and lake level, which are part of the Terrestrial Essential Climate Variables (TECV) defined by GCOS. It also is the scientific step towards a future Inland Water dedicated processor on the Sentinel-3 ground segment.

The main characteristics of the project will be summarized. Cooperation with the scientific community will be encouraged. Project documents available at the website (ATBD for example) will go through a critical review outside the project team so as to collect feedback. Valuable feedback will be taken into account so as to provide a new processing chain prototype that should be capable of providing high quality water heights, making it possible to couple it with the hydrological dynamic and semi-distributed model HYPE (Hydrological Predictions for the Environment). This model has been developed by SMHI and will be used to assimilate study's new "Alti-Hydro" Products to assess the added value of space altimetry in the forecast and hind-cast of river discharge, river water level, and lake water level for a varied range of study areas.